

Unraveling the self-made city: The spatial impact of informal real estate markets in informal settlements

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ABSTRACT

Informal real estate markets have developed as a result of deficiencies of formal real estate markets and play a crucial role in providing housing to the urban poor. This contribution combines an adaptation of Ostrom's rules with property rights theory to study the rules that have developed in the informal real estate, their spatial impact and implications of formal-informal interactions in an informal settlement in Nairobi, Kenya. It is argued that although the nature of formal and informal property rights regimes is highly similar, conflicts arise when the two concur as they are based on different forms of legitimacy: input and output legitimacy. To the formal market, the informal market is illegitimate as it infringes on formal property rights and planning regulations, whereas to the informal market, the formal market is illegitimate due to its excluding nature. The research opts for further research in the discipline of spatial planning in order to gain a better understanding of formal-informal interactions.

1. Introduction

Informal settlements are considered to be one of the biggest challenges of the 21st century, because they are characterized by rapid population growth, environmental degradation, high levels of urban poverty and inadequate access to basic services, such as water, sanitation and waste collection (Asian Development Bank, 2019; Gulyani & Bassett, 2007). Approximately since the turn of the century, academic literature has started to acknowledge that informal real estate plays a crucial role in providing low-cost shelter to the urban poor (Birch et al., 2016; Gulyani & Talukdar, 2008; Nkurunziza, 2007).

There is a growing consensus among scholars that informal settlements are not as chaotic or unorganized as often portrayed (Andersen et al., 2015; Cadstedt, 2010; Koster & Nuijten, 2016; Nunbogu et al., 2018; Roy, 2009). Within slum communities, institutions underpinning informal real estate markets have developed. These institutions are heavily intertwined with formal processes (Nkurunziza, 2007).

A new interest in the potential of informal housing comes in a time which has witnessed a more general shift in both planning theory and practice (Albrechts, 2006; Nunbogu et al., 2018). More scholars are now arguing for the importance of understanding cities through an institutional lens, which has allowed for more adaptive and incremental approaches within urban planning (van Karnenbeek & Janssen-Jansen, 2018).

The development of informal real estate markets is often seen as a consequence of deficiencies in formal real estate markets (Bernier, 2001; Birch et al., 2016; Gulyani & Talukdar, 2008; Kombe, 1994; Nkurunziza, 2007; Pellissery et al., 2017). Some of the shortcomings are a lack of access to formal credit, high transaction costs and an accumulation of regulations (Pellissery et al., 2017). As a result, informal processes, which regulate and underpin informal settlements, have evolved to “undermine, accommodate, complement and reinforce” formal real estate markets (Nkurunziza, 2007, p. 510). According to the Credibility Thesis, the persistence and successes of informal institutions can be explained not by its form, but its function and acceptance within a community (Ho, 2014, 2016).

However, there is a lack of literature regarding the rules and norms that actors use in governing urban developments. Rules are defined as “institutions that guide collective action based on laws, regulations, norms and habits” (van Karnenbeek & Janssen-Jansen, 2018, p. 403). A focus on rules is relevant because planning processes and outcomes are severely impacted and constrained by both formal and informal rules (Cozzolino et al., 2017; Moroni, 2010; North, 1991; Salet, 2018; van Karnenbeek & Janssen-Jansen, 2018). Specifically, in the context of slum real estate, studying the rules that guide actors in informal real estate markets could contribute to a better understanding of how informal and formal markets shape urban development.

This contribution explores the rules steering processes of informal

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real estate using an adaptation of Ostrom's rules. Combining these rules with property rights theory, the aim of this paper is to analyze how the existence of the informal and formal real estate market shapes urban development in informal settlements. An empirical case study was carried out in the neighborhood Lunga, located in Mukuru slum, Nairobi. As is typical for cities in the Global South, about 70% of Nairobi's population lives in informal settlements (Nkurunziza, 2007; UN-HABITAT, 2006). The Mukuru case study was selected based on two selection criteria, namely 1) high economic mobility, which is relevant as a large in- and outflow of people ensures the existence of a real estate market, and 2) the availability of plot profiles as this data is required for the spatial analysis.

A qualitative study was performed in order to create an in depth understanding of the rules of the informal and formal real estate market in Nairobi. Through a document analysis the Constitution of Kenya 2010,¹ the Land Registration Act (LRA),² the Land Act (LA)³ and the Physical Planning Act (PPA)⁴ were analyzed. Besides a document analysis, primary data was collected through eleven in-depth interviews that were conducted in July 2019. Among the interviewees were participants from both the formal market, including a quantity surveyor, an urban planner and a conveyance lawyer, and the informal market, namely five structure owners and two village elders (4 male, 3 female). Transcript data and documents were analyzed using qualitative content analysis in ATLAS.ti. The initial coding frame was based on the theoretical framework and adjusted through an iterative process of three subsequent rounds of coding. In addition, a geospatial analysis was performed in order to create an understanding of the spatial impact of the informal real estate market.

Three concepts and corresponding parameters of urban development were selected and measured in three microplots: one at a busy shopping street, one residential area in the center of the neighborhood, and one residential area at the edge of the neighborhood. These three micro-sites were located on a straight line through the neighborhood to ensure representation. Compactness was analyzed using the Ground Space Index (GSI) using secondary data (building extraction) from OpenStreetMap. Land use was expressed through the entropy index, using secondary data from OpenStreetMap and primary data on the function of space collected on the ground. The entropy index measures land use mix taking into account the relative percentage of land use types within an area (Zagorskas, 2016). Lastly, the concept of zoning was expressed through plot size, which was calculated using secondary data from OpenStreetMap.

2. Rules, property and the (in)formal city

The formal–informal dichotomy is a resource for naming, managing, governing, producing, and even critiquing contemporary cities. As argued by Roy (2005), informality shows us the importance of not only asking where things belong, but also whom they belong to. Whereas the right to property is based on the premise of exclusion, it can be challenged by those who claim the right not to be excluded (Blomley, 2014). These claims can be related to the works of Henri Lefebvre (1974), a phenomenon that he termed “the right to the city” and

contrasted with “the right to property”.

A local regime of lands includes all the rights, the distribution of them and the enforcement of these rights (Geuting & Needham, 2012). The assignment of property rights over a good excludes the use of others and means protection by the state (Buitelaar & Segeren, 2011). Property rights theory refers to the ownership of rights over the land, rather than the ownership of the land itself. These rights can be subdivided into bundles of rights (Cooter & Ulen, 2012; Needham et al., 2019). A distinction can be made between the assignment and the delineation of property rights. The assignment of property rights often refers to the entire bundle of rights, or at least a large part of it. Delineation, on the other hand, refers to the conditions under which a right can be exercised (Buitelaar & Segeren, 2011).

The way in which property rights are assigned and delineated influence land use. In many countries, state agencies can influence the way land is used through regulatory land use planning. The way in which rights are created, structured and trafficked also heavily influences land use (Geuting, 2007; Geuting & Needham, 2012; Needham et al., 2019). The assignment and delineation of property rights is enforced through private and law respectively (Cooter & Ulen, 2012). These instruments of enforcement are key in the functioning of property rights regimes. Only when enforced they give local authorities the power to achieve desired effects of spatial planning (Needham et al., 2019).

2.1. Unpacking institutions

In the case of informal property markets, there are often no legally binding agreements protecting the owner. However, this does not mean that informal activities are not regulated by informal agreements or rules. These sets of rules are what Ostrom (2005) refers to as institutions. Institutions define and limit the set of choices individuals have in their actions.

Ostrom's Institutional Analysis Development (IAD) framework centers around an action arena, which is defined as the social space where individuals interact, exchange goods and services, and solve issues. By this definition, real estate markets can be conceived as an action arena (Mooya, 2011). The structure of the action arena is jointly affected by three independent variables: the attributes of the community, biophysical conditions and rules that participants use to order their relationship (Ostrom, 2005). In this contribution, the focus of analysis is on one of these variables: the rules that govern institutional interactions.

Rules have been defined by different scholars, but the most widely used definition is given Black (1962), as mentioned in Ostrom (2005). Black recognized four definitions of rules: they can refer to laws, regulations, instructions and norms. They are prescriptions concerning actions, interactions and outcomes (Ostrom, 2005). Originally, Ostrom's framework has been applied to analyze rules within collective action. More recently it has also been applied in the domains of planning and water management, for instance in the studies by van Karmenbeek and Janssen-Jansen (2018) and Smajgl et al. (2009). As planning is a matter of collective action, Ostrom's framework is also highly relevant to planning theorists and practitioners.

Ostrom (2005) defined seven types of rules:

- *Boundary rules* specify who can play a role, how the decision of who is eligible is made and how an individual can leave a role.
- *Position rules* describe the different positions held by participants and the different kinds of authorities that come with positions.
- *Choice rules* define which actors may or may not act and how.
- *Payoff rules* specify rewards or sanctions to actions that have been taken.
- *Information rules* specify what information participants in particular roles must (not) communicate other participants.
- *Scope rules* define the set of outcome variables that must or must not be affected.

¹ Kenya: The Constitution of Kenya [Kenya], 27 August 2010, available at: <https://www.refworld.org/docid/4c8508822.html> [accessed 30 August 2019].

² The Land Registration Act [Kenya], 2 May 2012, available at: <https://www.ecolex.org/details/legislation/land-registration-act-2012-cap-300-lex-faoc112133/> [accessed 30 August 2019].

³ The Land Act [Kenya], 2 May 2012, available at: https://www.ecolex.org/details/legislation/land-act-2012-no-6-of-2012-lex-faoc112131/?q=land+act+2012+kenya&type=legislation&xdate_min=&xdate_max= [accessed 30 August 2019].

⁴ The Physical Planning Act [Kenya], 1996, available at: <https://www.ecolex.org/details/legislation/physical-planning-act-1996-cap-286-lex-faoc101236/> [accessed 30 August 2019].

- *Aggregation rules* specify who has responsibility for an action.

Ostrom's work has received some criticism for not paying adequate attention to the effect of the larger context on shaping outcomes (Clement, 2010) and its loyalty to a single behavioral dogma of orthodox economics: self-interest (Blind, 2015). Despite these criticisms, Ostrom's work still provides a groundbreaking step towards a theory of rules-based socio-economic theories.

2.2. Bringing rules and property rights together

The rules of formal real estate markets are clearly described in the laws of a country. However, as this research aims to analyze the rules of informal real estate markets, where the clarity of such laws is absent, there is the necessity to develop a different framework. This contribution abstracts from both property rights theory and Ostrom's IAD framework, to develop a framework that can be used to analyze the institutional arrangements for the structure and functioning of both the formal and the informal real estate market. As argued by Mooya (2011), abstracting from Ostrom's IAD-framework to study the institutional arrangements affecting urban land markets can lead to a better understanding of *"the dynamic, transactional nature of these markets"* (Mooya, 2011, p. 243).

As argued before, rights can be exercised through private and public law (Needham et al., 2019). Private law describes rules about how persons and who can own, use and transfer their rights (Cooter & Ulen, 2012). This definition of private law brings us back to Ostrom (2005), who identified three types of rules that are relevant to this definition of private law. When looking at the definition of *position, boundary and choice rules*, it becomes clear that together they form an elementary system of property rights. On the other hand, *scope rules* define the set of outcome variables that must or must not be affected as a result of actions taken. In the context of land, this is highly similar to public law, which defines the kind of spatial order that is desired (Needham et al., 2019). How rules are enforced influences their impact on land development. This is why when looking at the informal real estate market, it is important to look at what Ostrom calls *payoff rules*: the rewards or sanctions to actions taken. Based on property rights theory, this contribution assumes these five rules as most important in influencing urban development.

3. Case study: formal and informal real estate markets in Nairobi

In the following section results of the fieldwork in Nairobi are presented. First, the rules of the formal real estate market are described. These findings are based on the document analysis as described in the introduction. Second, the rules of the informal real estate market are presented. These results are based on the interviews with actors from the informal real estate market.

3.1. Property rights and planning in Nairobi

The Kenyan legal system is based on English common law. Land rights are described in the Constitution of Kenya 2010 and the Land Registration Act (LRA) 2012. Land use is regulated through the Land Act 2012 and the Physical Planning Act (PPA) 1996.

Housing prices in Nairobi have been increasing consistently over the past years. According to the *Hass Property Index (2020)* property values have increased over fourfold since 2000. With a national annual housing demand of 250,000 units and a supply of 50,000 units, the housing gap in Kenya is estimated at 2 million units (World Bank, 2017).

3.1.1. Position, boundary and choice rules

The most important actors in the formal real estate market are the government and owners, whose roles and requirements are described in

Table 1.

Article 61(2) of the Constitution of Kenya 2010 holds that land in Kenya is classified as either public, communal or private land. Public land is land that as of date is unalienated government land (art. 62) and community land is defined as land registered in the name of a group (art.63).

The focus of this contribution is on private land. Private land is defined as any land held by any person under freehold and leasehold tenure (Constitution of Kenya 2010, art. 64). The Constitution of Kenya 2010 and the LRA 2012 grant owners the right to use, control and transfer their land, either indefinitely (freehold) or for a period of 99 years (leasehold), with the right to extend the leasehold after 99 years. An owner has e.g. the right to construct, to change the use of the land, to subdivide the land, and to generate an income from it. According to article 24 of the LRA 2012, an owner must register for a title deed with the government in order to be recognized as the absolute owner of the plot. In conclusion, in the formal real estate market, the government has the power to assign bundles of rights to owners. Owners of rights can also reassign these rights.

3.1.2. Scope rules

Although the ownership of a plot of land comes with certain rights, each local authority has the power to prohibit or control the use and development of land and buildings according to the physical development plans (Constitution of Kenya 2010, art. 66). Change-of-use requests must thus be in line with the nature and trends of the neighborhood (PPA 2012, art. 41). Article 29 of the PPA 2012 also provides local authorities with the power to control subdivisions of land, to formulate by-laws to regulate zoning, and control the density of development. For example, the minimum size of a parcel is 0.05 ha. Ground coverage and plot ratio must be in line with the standards set by the local authority. The government thus has the right to delineate the rights of owners according to the standards set by these scope rules.

3.1.3. Payoff rules

The enforcement of the previously defined scope and choice rules happens through Kenya's legal and law enforcement systems. Offences are punished through fines or imprisonment. As became clear in the interviews, enforcement is a challenge to the government authorities. Thus, although rules are enforceable in a formal court of law, players in the formal market often take informal shortcuts. In the interviews, it was also mentioned several times that within the formal market, land ownership disputes resulting from false, informal or missing documentation are common.

3.2. Rules of informal real estate market

Lunga is a neighborhood in the larger Mukuru slum which is situated in the industrial area of Nairobi. Formally, the Lunga is located on public land, a riparian buffer between the river and industry. Within the neighborhood an informal real estate market has developed, which will now be analyzed.

3.2.1. Position, boundary and choice rules

The most important actors in the informal real estate market are the chief, the village elders and the structure owners. Their roles and requirements to the position are described in Table 2.

Formally, chiefs are stationed at the communal level as representatives of the Office of the President. Their duties are to monitor and report on the status of local infrastructure and public facilities, to ensure local security, and to mediate in local conflicts. Their involvement in the informal real estate market is not part of their jurisdiction.

Chiefs cooperate with village elders, who are considered to be the connection between the chief and Lunga residents. Large slums are divided into smaller villages; each village has its own village elder. These elders are members of the community and represent the chief

Table 1
Boundary, position and choice rules of the formal market.

Position rules	Boundary rules	Choice rules
Government	Be a Kenyan citizen; Possess an ID or passport; Be over 18 years old.	Allocate land; Officiate land transactions; Stipulate bylaws regarding construction of structures and the development of land.
Owners	No restrictions on race, gender, education level or ethnicity; Be over 18 years old; Possess an ID or passport; In case of freehold: be a Kenyan citizen.	Use, control or transfer their land indefinitely (in the case of freehold) or for 99 years (leasehold).

Table 2
Boundary and position rules of the informal market.

Positional rules	Boundary rules	Choice rules
Chief	Be a Kenyan citizen; Minimum of post-secondary education; Be over 18 years old.	Allocation of land; Officiate land transactions; and Provide bylaws regarding construction of structures and the development of land.
Village elder	Be a member of the local community; Chosen by community – usually the richest man in the Village.	Intermediate between structure owners and chief's office; Keep record of property owners; Witness to land transactions; Approve building construction and repairs; and Approve subdivisions.
Structure owner	No restrictions on race, gender, education level or ethnicity; Must possess an ID or passport; and must have proof of ownership, through purchasing contract or communal knowledge.	Owns a structure/piece of land;

when he is not present.

From the interviews it became clear that land has several coexisting meanings to the inhabitants of Lunga. Owning a structure or parcel of land allows inhabitants to rent out some of the rooms or start a home-based enterprise. Land is thus seen as an asset, a productive of wealth, and a commodity. As many inhabitants do not have a stable income, owning a structure (opposed to renting) also provides social security.

Two main types of de facto land holdings were identified, namely private and public land. Private land is owned by the structure owners. It is known by structure owners that formally they do not own the land. However, in the interviews it was stated by a structure owner that “*you cannot build a structure on someone else's land. Normally it is said that this is government land, but I bought everything. So, the land is mine and the structure is mine.*” (Structure owner 1, interview, July 8, 2019). Some structure owners also referred to the law of adverse possession, which is premised on the Limitations of Actions Act (art. 13)⁵ and allows a person who has unlawfully occupied another person's land for a continuous period of at least 12 years to legally apply for registration rights over the property. “*I take myself as if I own the land, because over 30 years nobody has claimed it. And the fact is that according to Kenyan Constitution, if you stay over 10 years, you become the owner*” (Structure owner 4, interview, July 10, 2019).

Besides private land, there is also public land in Lunga. This is (de facto) owned by the chief's administration. Examples of public land in Lunga include the land along the riverbank, land under electricity lines and the public roads. Public land can be allocated to structure owners by the chief through “an appreciation”, which refers to a cash payment. The height of this appreciation is dependent on personal relations to the chief, the individual's importance within the community and the purchasing power of the individual.

Land can also be accessed through purchase. Although the land market in Lunga is an informal one, the process of acquiring a plot of land in Lunga is one characterized by official steps that have to be taken

in order to formalize the transaction. An agreement is composed by the village elder, which is signed by the chief and two witnesses to each party. These transfer documents play an important role in proving ownership. However, it is also extremely important that the community sees you as the rightful owner, as the information who owns what is not kept in a register, but through collective memory.

The boundaries of a plot are not indicated on transfer documents or in any register, rather they are determined by taking the original space between two structures and dividing it by half. However, this process becomes more complicated as people extend their structures up until their boundaries. As stated in the interviews: “*I cannot go to the other side and my neighbor cannot go to the other side. Because everyone knows where the boundary is.*” (Structure owner 2, interview, July 8, 2019). Demarcations are thus also remembered through communal knowledge.

Once a structure owner buys or is allocated a parcel of land, they are granted the right to use, control and transfer that land indefinitely. A structure owner has the right to use their land and generate an income from it, the right to decide how the land should be used, the right to sell (part of) the parcel, and to transmit the land to their heirs through inheritance. From the interviews, it also became clear that an owner has the right to transfer use and control rights to someone else. Rights are held indefinitely, but if structure owners leave their parcel of land idle or underutilized, they may lose these rights.

3.2.2. Scope rules

Rights of structure owners are restricted through scope rules developed by the office of the chief, village elders, and community members themselves. The study revealed that there are no regulations with regards to zoning, but controls of the density of development and construction are in place. In order to construct a structure or to execute repairs permission needs to be given by the chief in exchange for a fee. During the construction, a village elder will come to the location to ensure no rules are broken. The village elder will look specifically at the materials used and whether the original size of the structure is preserved.

Most structures have the same dimensions of six by nine meters. Plot sizes can be different due to amalgamation and subdivision rights.

⁵ Limitations of Actions Act [Kenya], 1968, available at: <https://www.ecolex.org/details/legislation/limitation-of-actions-act-cap-22-lex-faoc128809/> [accessed 10 July 2020].

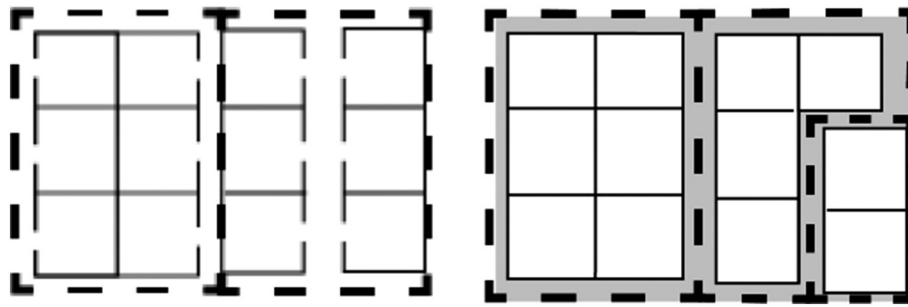


Fig. 1. Position of structure on the plot (l) and the process of subdivision (r).

When a structure owner decides to sell only part of their plot, there needs to be a small space between the rooms of one owner, and the rooms of another owner: *“It should be separated immediately if you sell only part. That is a rule. You have to separate to remove the conflicts between the two.”* (Village elder 2, interview, July 10, 2019). This process is illustrated in Fig. 1 (r). The space between two structures is often shared between two neighbors. A structure owner can extend their house up to the boundary of their plot, under the condition that a new access corridor is now created elsewhere on the plot (see Fig. 1 (l)).

As discussed before, the chief has the power to allocate public land to private owners. However, there are a few areas where village elders do not allow further development. These areas are often too dangerous to live in, for instance near the flood-prone river. Instead, these areas are used for leisure purposes. An informal bylaw prohibiting the construction of structures on the public access paths was also issued by the chief's office.

3.2.3. Payoff rules

Transactions of property within the informal real estate market are not enforced through a legal system. However, measures have been developed within the community to ensure that rules are adhered to. Within Lunga, property rights and land policies are enforced through informal political and communal systems. The village elders play an important role in gathering and sharing information of who owns what and to settle disputes with regards to property. Both the chief and the village elder earn money through the real estate market, giving them an important incentive to guard informal property rights.

In the interviews it was stated that when property rights are violated, the chief and the village elder have the power to take away someone's property. Furthermore, as most people know who owns what, falsely claiming ownership to a property can lead to rejection from the community. This leads to a high sense of tenure security within the community: *“It is impossible for someone else to claim my structure, but just in case, the village elder is here, the chief is here, and all those parties are aware.”* (Structure owner 2, interview, July 8, 2019). Falsely claiming ownership is thus severely limited through communal systems and through more formal punishments.

Scope rules are enforced through a combination of enforcement measures from the chief and village elders, and through social pressure from the community. Whenever repairs or new construction take place for which permission was not given, the chief and village elder have the power to halt the construction or demolish the structure. The exercise of scope rules is also influenced by neighborly control. These two systems of social pressure and more formalized enforcement mechanisms support and strengthen each other.

3.3. Spatial impact

The three microplots and the different land uses can be found in Fig. 2. Microplot 1 is characterized by a high diversity of land uses. Many shops are concentrated along the public roads. Both microplot 2 and 3 are characterized by mainly residential use. Microplot 3 is also

characterized by its large space available for leisure. This space functions as a playground for children as well as a flood management area. In Table 3 the characteristics of urban development in Lunga are summarized. These characteristics are influenced through several rules as identified previously.

3.3.1. Land use

As structure owners have the right to use their land as they wish, diversity in land use is high. Furthermore, there are the rules about the need to leave open space. Whereas the intent of this rule is to create safer living conditions, one of the (perhaps unintended) outcomes of this rule is the creation of open spaces used for leisure and infrastructural purposes. These rules combined make for a high entropy index within all three microplots.

3.3.2. Compactness

The relatively high compactness is caused by several rules. First, the rules regarding the construction of structures on the boundaries of plots directly increase compactness. Second, the chief may allocate open space in exchange for a premium. This provides an incentive to allocate as many plots as possible, which then leads to a higher compactness. There are also rules in place limiting compactness. For instance, structure owners must leave a small space on their plot for an access path and are not allowed to extend their plot unto the public roads.

3.3.3. Size of plots

Size of plots is determined by the standard size of a plot of 54 m², or six rooms of 3 × 3 meters. Variation in this size can be explained by the fact that owners have the right to subdivide or amalgamate their plot. Furthermore, it was indicated in the interviews that since there is little space left in Lunga, smaller plots have been allocated more recently.

Urban development in Lunga is thus characterized by a high diversity of land use, a high level of compactness of buildings and relatively small, yet varying sizes of plots. The results suggest that these urban development characteristics are influenced through scope rules which often have a direct spatial character, but also through choice rules, which have an indirect effect on spatial characteristics.

4. The formal-informal dichotomy: a story of legitimacy

The results show that both the informal and the formal market have developed their own set of rules. The rules of the formal real estate market are well-defined in the various legal documents analyzed. These rules are enforceable in a formal court of law.

Property rights in Lunga mimic those of the formal system. Just as in the formal real estate market, rights can be assigned and reassigned. However, ownership is not enforced through the legal system. Rather, it is enforced through informal political and communal systems. These systems allow for information to be shared, disputes to be settled, and access to land to be negotiated.

Although in this contribution the real estate market in Lunga is referred to as *informal*, many of the rules that have been put into place

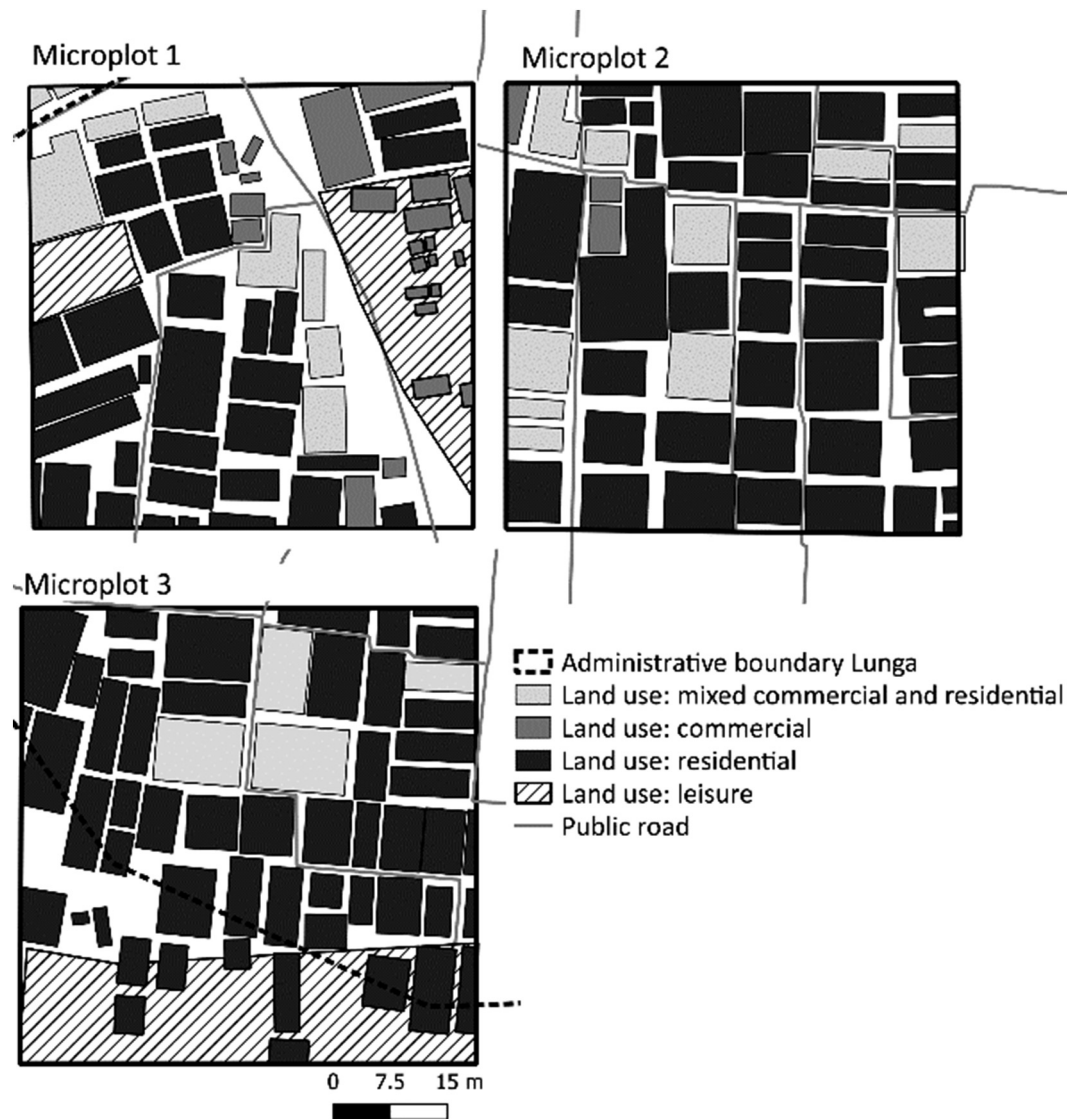


Fig. 2. Microplots and land use.

Table 3
Urban development characteristics in Lunga.

Concept	Index	Result	Interpretation
Land use	Entropy index	0.80	High diversity of land use
Compactness	Ground space index	68%	High level of compactness of buildings
Zoning	Average plot size	42 m ²	Relatively small structures/plots
	Range of plot sizes	6 m ² –195 m ²	Large range of plot sizes

are actually quite *formal* and secure in their context. People take the decision to invest in property based on confidence in the informal property rights system. Through informal practices, invisible boundaries are created (Yang, 2018), protecting the property of structure owners and controlling the behavior of community members. These findings are line with those of other authors arguing that slum-dwellers often enjoy high levels of de facto tenure security (Aristizabal & Gómez, 2004; De Souza, 2001; Gilbert, 2002; Nakamura, 2016; Reerink & van Gelder, 2010). This property rights system is highly similar in nature to the formal property rights regime: in both the formal and the informal market, the government or chief may allocate a plot of land to a

potential owner. Title deeds must be officialized by this actor for the structure owner to be recognized as an absolute owner. Owners have the right to use, own and control their plot of land.

In this research, rules shaping urban development were bundled under the name informal real estate markets, rather than urban planning. However, several scope rules were identified which have more of a planning nature, given their impact on the outcomes of urban development. These rules show a more publicly accountable character and were involved with political choice rather than market transactions. As argued by Ratcliffe and Stubbs (1996), this is a clear of planning opposed to a real estate market. However, as these rules are established and enforced outside of the public sector (the Kenyan government), it is more appropriate to refer to them as planning through real estate markets. These scope rules thus form an elementary planning system, similar in nature to the formal planning system, regulating the construction, location and size of plots.

The findings show that there are two main channels through which rules of the informal real estate market affect urban development of informal settlements:

1. The property rights regime – existing out of position, boundary and choice rules which determine the way the property rights market works, and thus indirectly influence urban development; and

2. Planning through real estate processes – existing out of scope rules which shape the outcome of urban development by placing restrictions on the bundle of rights of structure owners.

These two channels are in line with the findings of other authors who have studied the effect of formal property rights regimes such as Geuting (2007), Geuting and Needham (2012) and Needham et al. (2019).

Due to the likeness in nature of the two markets, and the similarity of the two channels through which the formal market shapes urban development, one might assume that the concurrence of the formal and informal market should not lead to any issues in urban development. However, there are many differences between them. In the informal market, communal systems are important in the recognition of ownership and the enforcement of rules. Although the nature of scope rules is similar, the rules in the informal market have been adjusted to fit the context of informal settlements: the requirements to plot sizes, construction, and the location and function of plots are vastly different from the formal real estate market.

As a result, the existence of formal and informal markets brings along many challenges. Informal rights are highly secure within the community itself and are even legitimized by informal landowners based on formal regulations on adverse possession. Despite this, they are rarely recognized by actors in the formal real estate market. As stated by Berner (2001, p. 295): “If illegal settlements are merely seen as a violation of private or public property rights, then the forceful and, if necessary, violent restoration of these rights is the obvious solution.” In those cases that informal property rights are recognized, formal titling, an approach applauded by authors such as De Soto (2001), in the informal market often makes slum housing too expensive to the majority of the urban poor (Berner, 2001; Desai & Loftus, 2013; Gilbert, 2002; Gulyani & Bassett, 2007; Payne et al., 2009). As a result, the implementation of formal property rights or land regulations in informal settlements often leads to dispossession of the urban poor.

These challenges have been well-documented and are related to the core issue of the existence of formal and informal markets: the different types of legitimacy of both markets. Schmidt (2013) and Needham et al. (2019) argue that there are three forms of legitimacy, namely input, throughput and output legitimacy. Input legitimacy is derived from the agency that takes the action, and thus refers to the quality of the representation of public interests in the agent taking the action. Throughput legitimacy is derived from the process used to take an action, and thus refers to the quality of the decision-making process. Lastly, output legitimacy is derived from the results that are achieved, thus when most people support the results of a certain action.

The formal real estate market and land regulations as imposed by the Kenyan government are mostly characterized by input legitimacy: they are considered legitimate because they are imposed by an elected government, which represents and is accountable to the people of Kenya. On the other hand, the informal market is characterized by output legitimacy. The rules in place are there because they are pragmatic. Without these rules informal settlements would become chaotic and unlivable places.

Conflicts between the two markets arise as neither of them regards the other as fully legitimate. Although the markets are highly similar in nature, the informal market is not recognized by the formal market. According to the formal system, the informal market is illegitimate because it was not delegated power via the elected government. On the other hand, actors within informal real estate see the formal system as illegitimate as it does not provide them with affordable housing.

This issue of legitimacy relates to Henri Lefebvre's *right to the city* versus *the right to property* (Lefebvre, 1991). Inhabitants of informal settlements claim their right to the city through the informal real estate market. However, informal property rights are seen as illegitimate by formal actors because of their illegality, defying the right to property of those who formally own the land informal settlements are located on.

5. Conclusion

Informal real estate markets play an important role in providing housing to the urban poor. In the introduction it was argued that informal real estate markets are not as chaotic as often portrayed (Andersen et al., 2015; Cadstedt, 2010; Koster & Nuijten, 2016; Nunbogu et al., 2018; Roy, 2009). This research has demonstrated that this is indeed the case: informal real estate markets are underpinned by many rules. Moreover, these rules are similar in nature to formal real estate markets. Just like the formal real estate market, informal markets are characterized by a property right regime and a (albeit elementary) planning system.

Although the informal and formal markets are similar in nature, the informal market has been adapted to fit the context of informal settlements. As a result, the urban poor are able to bypass the deficiencies of the formal real estate market, such as a lack of access to formal credit and an accumulation of regulations (Pellissey et al., 2017) and claim their right to the city, through these informal markets.

This case has shown the importance of embedding informal structures in research on urban development. In the context of informal settlements these rules are not formalized, nevertheless they guide collective action. Studying these rules is crucial in creating a better understanding on how the interaction of formal and informal real estate markets is impacting urban development.

This paper allows for further analysis of informal property rights regimes in relation to formal regimes. Two main directions of research can be recommended, focusing on both the empirical and the theoretical.

First, this research used a case study approach to create a better understanding of informal real estate. This phenomenon is not limited to one informal settlement in Nairobi. Further studies should focus more elaborately on the interface of the formal and informal market. For instance, studying the effects of formal slum upgrading schemes on informal land markets could provide more insights into how informal and formal markets affect and shape each other. The coexistence of formal and informal institutions in different contexts where markets are for instance more formalized, in a different stage of development or manage entirely different resources, e.g. flood, infrastructure and green space management would also be interesting for further studies. Researching the coexistence of formal and informal institutions in different contexts will allow for the development of a more solid theory on the relationship between informality, formality and legitimacy. Second, further theoretical investigations of the conflict between different forms of legitimacy of formal and informal institutions are necessary to create a better understanding of formal-informal interactions. Here, the connection between the right to the city and informality can also be further explored. Incorporating these two angles will allow for a better understanding of the coexistence of multiple property rights regimes.

CRedit authorship contribution statement

Josje Bouwmeester: Conceptualization, Methodology, Formal analysis, Investigation, Writing – Original draft, Visualization.

Thomas Hartmann: Writing – Review and Editing, Supervision.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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